## **CLAIMS**

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We claim as our invention:

A method of manufacturing an insulated component, the method
comprising:

providing a substrate having a surface;

depositing a layer of ceramic insulating material on the substrate surface; and forming a continuous gap in a top surface of the layer of ceramic insulating material to define segments therein, the continuous gap having a width at the top surface of less than 100 microns.

- 2. The method of claim 1, further comprising forming the continuous gap to have a width of less than 75 microns.
- 15 3. The method of claim 1, further comprising forming the continuous gap to have a width of less than 50 microns.
  - 4. The method of claim 1, further comprising forming the continuous gap to have a depth that does not extend through an entire thickness of the layer of ceramic insulating material.
  - 5. The method of claim 1, further comprising forming the continuous gap using a laser engraving process.
    - 6. The method of claim, 1, further comprising:

forming a first plurality of continuous gaps to a first depth into the layer of ceramic insulating material; and

forming a second plurality of continuous gaps to a second depth into the layer of ceramic insulating material.

7. The method of claim 1, further comprising forming the continuous gap by: exposing the top surface to a first pass of laser energy having a first parameter to form the continuous gap; and

exposing the continuous gap to a second pass of laser energy having a second parameter different than the first parameter to change a geometry of the continuous gap.

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- 8. The method of claim 7, wherein the second pass of laser energy has a wider beam footprint than that of the first pass of laser energy.
- 9. The method of claim 7, wherein the second pass of laser energy has a pulsation frequency that is greater than that of the first pass of laser energy.
- 10. The method of claim 1, further comprising forming the continuous gapusing laser energy delivered through a fiber optic cable.
  - 11. The method of claim 1, further comprising forming the continuous gap with a laser engraving process using a lens having a focal length of at least 160 mm in order to reduce accumulation of molten material splashed onto the lens during the laser engraving process.
  - 12. The method of claim 1, further comprising forming the continuous gap to follow a direction of a fluid stream over the top surface when the component is in use.
- 25 13. The method of claim 1, further comprising forming a plurality of continuous gaps in the top surface at a spacing between adjacent gaps of less than 750 microns.
- The method of claim 13, further comprising forming the plurality of continuous gaps in the top surface at a spacing between adjacent gaps of less than 500 microns.

- 15. The method of claim 13, further comprising forming the plurality of continuous gaps in the top surface at a spacing between adjacent gaps in a range of 500-750 microns.
- 16. The method of claim 1, further comprising: depositing a first layer of ceramic insulating material on the substrate surface; forming a first plurality of continuous gaps in a top surface of the first layer; depositing a second layer of ceramic insulating material on the top surface of the first layer; and
- forming a second plurality of continuous gaps in a top surface of the second layer.
  - 17 The method of claim 16, further comprising forming each of the gaps in the top surface of the second layer to have a width at the top surface of less than 100 microns.
  - 18. A method of manufacturing an insulated component, the method comprising:

providing a substrate having a surface;

depositing a layer of insulating material on the substrate surface; forming a gap in a top surface of the layer of ceramic insulating material by applying a first material removal process to the top surface; and reshaping the gap by applying a second material removal process to the gap.

19. The method of claim 18, further comprising:

forming the gap in a top surface of the layer of ceramic insulating material by exposing the top surface to a first exposure of energy having a first parameter; and reshaping the gap by exposing walls defining the gap to a second exposure of energy having a second parameter different than the first parameter.

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- 20. The method of claim 19, wherein the energy used for both the first exposure and the second exposure is laser energy and the second exposure of laser energy has a wider beam footprint than that of the first exposure of laser energy.
- 21. The method of claim 19, wherein the energy used for both the first exposure and the second exposure is laser energy and the second exposure of laser energy has a pulsation frequency that is greater than that of the first exposure of laser energy.

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- 10 22. The method of claim 19, wherein the first exposure of energy and the second exposure of energy utilize different forms of energy.
  - 23. The method of claim 18, wherein the gap is reshaped to have a generally U-shaped bottom geometry.
  - 24. A method of manufacturing an insulated component for use in an air stream environment, the method comprising:

applying a heat-inducing process to a top surface of a layer of ceramic insulation of a component to form a continuous groove bordered by a ridge along the top surface;

applying the heat-inducing process to form the continuous groove and ridge to follow a direction of a fluid stream over the top surface when the component is in use; and

using the component in the fluid stream without removing the ridge.

25. The method of claim 24, further comprising using a laser-engraving process to form the continuous groove to have a width at the top surface of between 25-125 microns.

26. The method of claim 24, further comprising:

forming a first plurality of continuous grooves to a first depth into the layer of ceramic insulation; and

forming a second plurality of continuous grooves to a second depth into the layer of ceramic insulation to define a plurality of failure planes in the layer of ceramic insulation.

27. A method of manufacturing an insulated component, the method comprising:

providing a substrate having a surface;

depositing a layer of ceramic insulating material on the substrate surface;

forming a first plurality of grooves to a first depth into the layer of ceramic insulating material; and

forming a second plurality of grooves to a second depth into the layer of ceramic insulating material.

28. The method of claim 27, further comprising forming the grooves each to have a width at a top surface of the layer of ceramic insulating material of less than 100 microns.

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- 29. The method of claim 27, further comprising forming the grooves each to have a width at a top surface of the layer of ceramic insulating material of less than 75 microns.
- 25 30. The method of claim 27, further comprising forming the grooves each to have a width at a top surface of the layer of ceramic insulating material of less than 50 microns.
- 31. The method of claim 27, further comprising forming the grooves each to follow a path of an air stream flowing over a top surface of the layer of ceramic insulating material during use of the component.

32. A method of manufacturing an insulated component, the method comprising:

providing a substrate having a surface;

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depositing a first layer of ceramic insulating material on the substrate surface;

forming a first plurality of grooves into the first layer of ceramic insulating material;

depositing a second layer of ceramic insulating material onto the first layer of ceramic insulating material; and

forming a second plurality of grooves into the second layer of ceramic insulating material.

- 33. The method of claim 32, further comprising forming each of the second plurality of grooves to have a width at a top surface of the second layer of ceramic insulating material in the range of 25-125 microns.
- 34. The method of claim 32, further comprising forming each of the second plurality of grooves to have a width at a top surface of the second layer of ceramic insulating material of less than 100 microns.
- 35. A method of manufacturing an insulated component, the method comprising:

applying a bond coating to a surface of a component;

applying a thermal barrier coating to the bond coating to create a bond coating/thermal barrier coating interface; and

decreasing a crack driving force at a location along the bond coating/thermal barrier coating interface by engraving respective grooves to respective partial depths into the thermal barrier coating on opposed sides of the location.